What is claimed is:

[Claim 1] 1. A metal layer structure comprising:

a substrate;

a first dielectric layer on a surface of the substrate;

at least one first conductor on the first dielectric layer; and

at least one second conductor on the first dielectric layer, the second conductor having at least one thin portion.

[Claim 2] 2. The metal layer structure of claim 1 wherein the second conductor has at least one thick portion.

[Claim 3] 3. The metal layer structure of claim 2 wherein a thickness of the first conductor is equal to a thickness of the thick portion.

[Claim 4] 4. The metal layer structure of claim 2 wherein a ratio of a thickness of the thick portion to a thickness of the thin portion is approximately 1 to 8.

[Claim 5] 5. The metal layer structure of claim 2 wherein a thickness of the thick portion is approximately 0.8 to 1.6μm, and a thickness of the thin portion is smaller than 0.8μm.

[Claim 6] 6. The metal layer structure of claim 1 further comprising:

a first opening exposing the first conductor;

a second opening exposing the thin portion; and

a second dielectric layer on the first dielectric layer that covers the first conductor and the second conductor.

[Claim 7] 7. The metal layer structure of claim 6 wherein the second dielectric layer is a PE-oxide layer.

[Claim 8] 8. The metal layer structure of claim 1 wherein the surface of the substrate further comprises at least one third dielectric layer and at least one metal structure disposed in the third dielectric layer.

[Claim 9] 9. The metal layer structure of claim 8 wherein the metal structure is copper (Cu).

[Claim 10] 10. The metal layer structure of claim 8 wherein the third dielectric layer is a low-k dielectric layer.

[Claim 11] 11. The metal layer structure of claim 8 wherein the metal structure is copper, and the third dielectric layer is a low-k dielectric layer.

[Claim 12] 12. The metal layer structure of claim 11 wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5.

[Claim 13] 13. The metal layer structure of claim 11 wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer.

[Claim 14] 14. A metal layer structure comprising:

a substrate;

a first dielectric layer on a surface of the substrate;

at least one first conductor on the first dielectric layer; and

at least one second conductor on the first dielectric layer;

wherein the first conductor and the second conductor have a first thickness and a second thickness,

respectively, and the first thickness and the second thickness impart different functions to the first conductor and second conductor, respectively.

[Claim 15] 15. The metal layer structure of claim 14 wherein a ratio of the first thickness to the second thickness is approximately 1 to 8.

[Claim 16] 16. The metal layer structure of claim 14 wherein the first thickness is approximately 0.8 to 1.6μm, and the second thickness is smaller than 0.8μm.

[Claim 17] 17. The metal layer structure of claim 14 further comprising:

a first opening exposing the first conductor;

a second opening exposing the second conductor; and

a second dielectric layer on the first dielectric layer that covers the first conductor and the second conductor.

[Claim 18] 18. The metal layer structure of claim 17 wherein the second dielectric layer is a PE-oxide layer.

[Claim 19] 19. The metal layer structure of claim 14 wherein the surface of the substrate further comprises at least one third dielectric layer and at least one metal structure disposed in the third dielectric layer.

[Claim 20] 20. The metal layer structure of claim 19 wherein the metal structure is copper (Cu).

[Claim 21] 21. The metal layer structure of claim 19 wherein the third dielectric layer is a low-k dielectric layer.

[Claim 22] 22. The metal layer structure of claim 19 wherein the metal structure is copper, and the third dielectric layer is a low-k dielectric layer.

[Claim 23] 23. The metal layer structure of claim 22 wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5.

[Claim 24] 24. The metal layer structure of claim 22 wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer.

[Claim 25] 25. A fuse structure comprising:

a substrate, a bonding pad area and a fuse area being included on a surface of the substrate;

a first dielectric layer on the surface of the substrate;

at least one first conductor on the first dielectric layer in the bonding pad area; and

at least one second conductor on the first dielectric layer in the fuse area;

wherein the first conductor having a first thickness is used as a bonding pad, and the second conductor having a second thickness smaller than the first thickness is used as a fuse.

[Claim 26] 26. The fuse structure of claim 25 wherein a ratio of the first thickness to the second thickness is approximately 1 to 8.

[Claim 27] 27. The fuse structure of claim 25 wherein the first thickness is approximately 0.8 to 1.6μm, and the second thickness is smaller than 0.8μm.

[Claim 28] 28. The fuse structure of claim 25 further comprising:

a first opening exposing the first conductor;

a second opening exposing the second conductor; and

a second dielectric layer on the first dielectric layer that covers the first conductor and the second conductor.

[Claim 29] 29. The fuse structure of claim 28 wherein the second dielectric layer is a PE-oxide layer.

[Claim 30] 30. The fuse structure of claim 25 wherein the surface of the substrate further comprises at least one third dielectric layer and at least one metal structure disposed in the third dielectric layer.

[Claim 31] 31. The fuse structure of claim 30 wherein the metal structure is copper (Cu).

[Claim 32] 32. The fuse structure of claim 30 wherein the third dielectric layer is a low-k dielectric layer.

[Claim 33] 33. The fuse structure of claim 30 wherein the metal structure is copper, and the third dielectric layer is a low-k dielectric layer.

[Claim 34] 34. The fuse structure of claim 33 wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5.

[Claim 35] 35. The fuse structure of claim 33 wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer.

[Claim 36] 36. A fuse structure comprising:

a substrate, a fuse area being included on a surface of the substrate;

a first dielectric layer on the surface of the substrate;

at least one fuse on the first dielectric layer in the fuse area, the fuse having a thin portion and a thick portion;

a second dielectric layer on the first dielectric layer that covers the thick portion; and

a first opening in the second dielectric layer exposing the thin portion.

[Claim 37] 37. The fuse structure of claim 36 wherein a ratio of a thickness of the thick portion to a thickness of the thin portion is approximately 1 to 8.

[Claim 38] 38. The fuse structure of claim 36 wherein a thickness of the thick portion is approximately 0.8 to 1.6 μm, and a thickness of the thin portion is smaller than 0.8 μm.

[Claim 39] 39. The fuse structure of claim 36 further comprising:

at least one bonding pad on the first dielectric layer in a bonding pad area;

a second opening in the second dielectric layer exposing the bonding pad; and

a third dielectric layer on the second dielectric layer that covers the thin portion.

[Claim 40] 40. The fuse structure of claim 39 wherein the third dielectric layer is a PE-oxide layer.

[Claim 41] 41. The fuse structure of claim 36 wherein the surface of the substrate further comprises at least one fourth dielectric layer and at least one metal structure disposed in the fourth dielectric layer.

[Claim 42] 42. The fuse structure of claim 41 wherein the metal structure is copper (Cu).

[Claim 43] 43. The fuse structure of claim 41 wherein the fourth dielectric layer is a low-k dielectric layer.

[Claim 44] 44. The fuse structure of claim 41 wherein the metal structure is copper, and the fourth dielectric layer is a low-k dielectric layer.

[Claim 45] 45. The fuse structure of claim 44 wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5.

[Claim 46] 46. The fuse structure of claim 44 wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer.

[Claim 47] 47. A metal layer structure comprising:

a substrate;

a first dielectric layer on a surface of the substrate;

at least one first conductor on the first dielectric layer; and

at least one second conductor on the first dielectric layer;

wherein the first conductor having a first thickness is a first material, and the second conductor having a second thickness different from the first thickness is a second material.

[Claim 48] 48. The metal layer structure of claim 47 wherein a ratio of the first thickness to the second thickness is approximately 1 to 8.

[Claim 49] 49. The metal layer structure of claim 47 wherein the first thickness is approximately 0.8 to 1.6μm, and the second thickness is smaller than 0.8μm.

[Claim 50] 50. The metal layer structure of claim 47 further comprising:

a first opening exposing the first conductor;

a second opening exposing the second conductor; and

a second dielectric layer on the first dielectric layer that covers the first conductor and the second conductor.

[Claim 51] 51. The metal layer structure of claim 50 wherein the second dielectric layer is a PE-oxide layer.

[Claim 52] 52. The metal layer structure of claim 47 wherein the surface of the substrate further comprises at least one third dielectric layer and at least one metal structure disposed in the third dielectric layer.

[Claim 53] 53. The metal layer structure of claim 52 wherein the metal structure is copper (Cu).

[Claim 54] 54. The metal layer structure of claim 52 wherein the third dielectric layer is a low-k dielectric layer.

[Claim 55] 55. The metal layer structure of claim 52 wherein the metal structure is copper, and the third dielectric layer is a low-k dielectric layer.

[Claim 56] 56. The metal layer structure of claim 55 wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5.

[Claim 57] 57. The metal layer structure of claim 55 wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer.